Reynobond® NC
Fabrication Guidelines
General

Reynobond® NC panels are new pre-painted aluminum sheets for building facades that possess supreme flatness, dent resistance, and long-term durability. The panels meet the same flatness tolerances that are available in traditional aluminum composite materials (ACM) for the same size sheets, and carry the same finish warranties. However, they are much stiffer than traditional ACM materials in the same thickness, and are capable of being fabricated with the same methods used in plate-aluminum fabrication. These panels marry the best parts of ACM with the benefits of plate material to provide the building owner with a unique product that can be installed in rout-and-return ACM systems or sheet metal attachment systems.

Storage and Handling

Reynobond NC sheets are cut to length at the manufacturing facility and are packed on cushioned wooden skids. These skids are enclosed with a combination of foam and cardboard, and are banded in both directions in order to minimize movement during shipment. The panels weigh 1.78 lb/ft² and are composed of two 1.5mm (0.063in) sheets bonded together in Alcoa’s aluminum bonding technology. Reynobond NC must be stored in a cool, dry place for twenty four hours before fabrication occurs. The panels have no core material in them, but their finishes can still be sensitive to localized pressures. No miscellaneous materials should be stacked on top of the panels after transport in order to minimize the risk of ghosting on the surface of the panels. Also, the panels should be handled with caution from multiple locations along their length, and should be protected from other materials during the fabrication process with foam blocks or some like material. Reynobond NC panels will expand and contract with the same expansion coefficient as solid aluminum; therefore, ambient temperature and the operating temperature range of the installed panels should be considered during fabrication. The usable temperature range for Reynobond NC is -40 – 180 °F. As in the case of standard Reynobond Polyethylene (PE) core or Fire Resistant (FR) panels, the paint direction and batch should be accounted for during planning and installation to avoid variations between panels on the same building surface. The paint finish should cover any exposed surfaces of the product as well as any contact points with attachment materials. Installed panels should always be protected from other metals with a barrier of some sort in order to minimize galvanic reactions.
Cutting and Forming

Reynobond NC panels can be machined and formed according to the same methods used for forming Reynobond PE and FR core composite panels. Sawing and routing can be performed with ordinary commercial metal and woodworking equipment. Cutting blades and router bits are available through independent distributors. A list of potential manufacturers is listed at the end of this guide. Cutting sheets can be performed with either a circular saw or a milling bit. The panels can be cut with a metal-cutting circular saw used to cut aluminum sheets. In order to maintain a long tool life, only one Reynobond NC sheet should be sawed during a cycle of the saw blade. Line cuts should be made with an 8” diameter, 80 tooth, carbide-tipped combination rip and crosscut blade. When performing a cut with a circular saw, the panels should be placed on their back side with the protective film facing opposite the frame of the saw.

Automated vertical and horizontal panel saws are available through equipment manufacturers and distributors. These panel saws allow multiple vertical and horizontal routs and cuts to be made on one sheet at a time. Reynobond panels are usually mounted vertically in the fixture, and the cutting operation performed in this manner requires less shop floor area than if the panels are placed flat on a table. Panel saws can streamline the fabrication process.

Grooved cuts can be performed with standard Reynobond ACM. We recommend using a 110° tungsten-carbide bit with a 1/16” wide flat-nose traveling at a feed rate less-than or equal-to 3 feet per-minute and spinning at 24,000 rpm’s. This method gives the best results for cutting a 90° fold, which can be used for a return leg. The plunge depth of the bit should leave no less than 0.7mm or 0.032 inches of metal remaining in the groove. Return legs should be turned using a U-shaped jig with a manual lever, and should not be bent more than one times. If the return leg is longer than four feet multiple jigs should be used at the same time to perform the bend in one motion. In order to ensure full bending, it is recommended to bend the leg at least 10° past the intended angle and to allow it to relax back to the desired angle. Recommended bit angles for v-groove cutting are between 90° to 135°, but the bit should always have at least a 1/16” wide flat-nose.
Reynobond NC can be folded like aluminum plate with a metal folding machine. When performing folds, tooling should allow for a 2-T bend to avoid crazing the finish or cracking the paint. Folds can be made up to 90° angle. Knife dies and other punching machines should not be used for folding Reynobond NC panels as they will harm the finish and cause bowing around the bent edge. Corners should be mitered with a 90° sharp-nose grooving bit when folding return legs together.

**Radiusing**

Reynobond NC panels can be radiused to curved configurations for column covers, architectural bullnoses, radius-building corners and other applications requiring radius forming. This process can be accomplished with a “pyramid” rolling machine, which consists of three or four motor-driven adjustable rollers. The multiple layers of the Reynobond NC panels causes a spring-back effect, that is more pronounced than with aluminum sheet. In 3-roll formers, the leading and exiting edge of the panel will be flat. It is a good idea to have 3-5" of extra length depending on the The minimum radius for the panels is 6" and can be achieved through multiple passes through the rollers.

**Attachment and Assembly**

Reynobond NC panels can be easily installed for both exterior and interior applications. Wet-seal and rainscreen systems are available from our North American network of fabricators. Most installations use rout-and-return method. The rout-and-return installation method is accomplished with a continuous V-shaped routed groove made around the entire panel perimeter at a constant distance of 1" (25 mm) from the panel edge. A minimum thickness of 0.032" (0.81 mm) of face material must remain after routing. The corners are removed and the edges are folded to create a 1" (25 mm)-deep "pan" or cassette. The corners are reinforced with riveted aluminum angles to stiffen the panel unit.
Rivets commonly used for aluminum are suitable for fastening the panels to the aluminum angles. Rivets must be placed at a distance of at least 10 mm from the edge of the sheet. This value may change according to the loading requirements of the Reynobond NC double sheet material, and varies with the thickness of the material to be joined to the panels. When selecting a rivet, we recommend a safety coefficient of at least 2.5 times the tensile and shear strength of rivet being used. The manufacturers recommended pressure applied to attach the rivet on the Reynobond NC panels should be followed to avoid unbuttoning of the rivet. When used outdoors, it is necessary to provide a running clearance of 2 mm between the minimum diameter and the diameter of the rivet hole of the* Reynobond NC panel to reflect the linear expansion coefficient of $1.136 \times 10^{-3}$ in/in°F (0.0236 mm / m / °C).

Attachment using countersunk screws with bolts is a secondary method of attachment, but this method does not accommodate for expansion or contraction at fastening points. Large washers should be used to distribute the clamping loads. Assembly without washer could cause a creep and significantly reduce the clips’ performance.

Reynobond NC panels can be welded with similar techniques that are used for aluminum plate. Welding can be useful for stud welding projection studs to the back of panels, but is not recommended for closing corners. When performing a stud weld, first grind off the backside finish exposing the bare aluminum skin. Once the paint is removed, a 5000 series aluminum stud can be arc welded to the surface. Welding temperatures and parameters should follow the stud weld manufacturer’s guidelines, but should not produce enough heat on the opposite surface to damage the front finish. Only aluminum studs should be used for this process.

It is possible to install panels into specially designed extrusions which pinch the panel into a specially designed channel. Depending on the shape of the profile, it may be possible, before assembly, to tighten the flanges of the profile to improve the strength of the mounting system. For mounting outdoors or for large panels, we recommend utilizing a additional fastening rivets hidden under the extrusion to provide extra support.
Panel Reinforcement

Reynobond NC panels can be strengthened in various ways to resist wind and reduce deflection. The stiffeners are generally in the form of 1” to 1.5” aluminum extrusions whose size depends on the support required. These extrusions are bonded to unexposed backside of the panel at regular intervals and act as supporting beams. Wind or pressure differential force on the panel is transferred to the stiffeners, which transfer the force outwardly to the edge of the panel. Stiffeners are most effective if they are attached across the shortest panel dimension. Fasteners used to attach the panel to the structural supports should be placed as close to the stiffener end location as possible, so that the loads can be transferred from the stiffener to the support in the most direct manner.

Stiffener spacing depends on variables such as the strength of the stiffeners, their spacing, the wind force, the maximum deflection, the strength of the attachments and the spacing of the supports. Since the maximum deflection of the panel is located at its geometric center, it is necessary to place a stiffener in the middle of the panel, and then position the other stiffeners at regular intervals.

Cleaning and Maintenance

Frequent and regular cleaning is recommended. The frequency of cleaning and choosing the right product depends on the location of the building and the degree of soiling. The washing should be done in stages, from the bottom to the top. Cleaning should be either manually or using special equipment at moderate to light pressure. Only appropriate cleaning products may be used, and after cleaning the panels should be rinsed systematically with clean water to remove residual cleaning products. Excess rinse water should be wiped from the surface with a sponge, squeegee or Chamois to prevent mineral deposits from accumulating. Cleaning products to avoid are high alkaline products, acids, and solvents prohibited in our cleaning technical bulletin. In all cases a small inconspicuous spot should be chosen for testing the effect of the cleaner.

In the case that panels are scratched during fabrication or installation. Small scratches can be touched up with air-dry paint in combination with an artist's brush. Small dents can be repaired with body filler prior to their painting. A suitable surface preparation, for example blasting and applying a primer layer, may be required to obtain satisfactory results.
Sources of Equipment & Accessories

The following is a list of material and equipment sources related to the fabrication of Reynobond NC double sheet panels. This list can be used by customers and fabricators to locate materials, equipment or accessories. These sources are for reference only and do not represent a complete list of available suppliers. Alcoa Architectural Products does not endorse or guarantee the quality of their materials and/or services.

Cutting Tools
AXYZ International
5330 South Service Road
Burlington, ON L7L 5L1
Canada
Tel: 800 361 3408
Tel: 905 634 4940
Fax: 905 634 4966
www.axyz.com
G. C. Peterson Machinery
2300 Myrtle Avenue – 100
St. Paul, MN 55114
Tel: 651 789 5360
Fax: 651 789 5369
www.gcpeterson.com
MSC Industrial Supply Co.
20 Parkway View Dr.
Pittsburgh, PA 15205
Tel: 800 645 7270
www.mscdirect.com
Hypneumat, Inc.
5900 West Franklin Drive
Franklin, WI 53132
Tel: 800 228 9949
Tel: 800 323 7133
www.hypneumat.com

Fasteners
Atlas Fasteners
1628 Troy Road
Ashland, OH 44805
Tel: 419 289 6171
www.atlasfasteners.com
SFS Intec, Inc.
Spring St. and Van Reed Road
P.O. Box 6326
Wyoming, PA 19610
Tel: 800 234 4533
Tel: 610 376 5751
Fax: 610 376 8551
www.sfsintecusa.com

Panel Saws
Colonial Saw, Inc.
122 Pembroke Street
P.O. Box A
Kingston, MA 02364
Tel: 781 585 4364
www.csaw.com
HOLZ-HER
5120 Westinghouse Blvd.
Charlotte, NC 28273
Tel: 704 587 3400
www.holzher.com
Komo Machine, Inc.
1 Gusmer Drive
Lakewood, NJ 08701
Tel: 800 255 5670
www.komo.com

Panel Cleaning
Alumitech Limited
311 W. Washington St.
Chicago, IL 60606
Tel: 312 920 6300
www.alumitecltd.com

Rollforming Equipment
Watson Hegner Corp.
160 Gibson Court
Dallas, TX 75203
Tel: 704 922 9660
Fax: 704 922 9841
www.watsonhegner.com

Silicone Sealants
Dow Corning Corp.
2200 W. Salzburg Rd.
Midland, MI 48666
Tel: 989 496 4400
www.dowcorning.com
G E Silicones Headquarters
187 Danbury Road
Wilton, CT 06897
Tel: 800 255 8886
www.gesilicones.com
Tremco, Inc.
3735 Green Rd.
Beachwood, OH 44122
Tel: 216 292 5000
Tel: 800 321 7906
www.tremcosealants.com

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